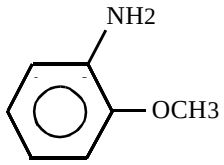
o-ANISIDINE

o-Anisidine is a federal hazardous air pollutant and was identified as a toxic air contaminant in April 1993 under AB 2728.

CAS Registry Number: 90-04-0

Molecular Formula: C_7H_9NO



o-Anisidine is a yellowish liquid with a characteristic amine odor (HSDB, 1991). It becomes brownish on exposure to air and is volatile with steam. o-Anisidine is miscible with alcohol and ether, but is practically insoluble in water (Merck, 1989).

Physical Properties of o-Anisidine

Synonyms: anisidine, isomers; (methoxyphenyl)amine; aminoanisole; o-methoxyaniline; o-aminoanisole; 2-aminoanisole

Molecular Weight:	123.15
Boiling Point:	225 °C
Melting Point:	5 °C
Vapor Density:	4.25 (air = 1)
Density/Specific Gravity:	1.098 at 15/15 °C
Vapor Pressure:	1 mm Hg at 61 °C
Log Octanol/Water Partition Coefficient:	0.95
Conversion Factor:	1 ppm = 5.04 mg/m^3

(HSDB, 1991; Merck, 1989; U.S. EPA, 1994a)

SOURCES AND EMISSIONS

A. Sources

o-Anisidine can be emitted from facilities where it is manufactured or where it is used as an intermediate in the production of azo dyes or guaiacol. It has also been identified in cigarette smoke. o-Anisidine has been identified in discharges from chemical plants and from oil refineries (HSDB, 1991). The primary stationary sources that have reported emissions of o-anisidine in California are educational institutions (ARB, 1997b).

B. Emissions

The total emissions of o-anisidine from stationary sources in California are estimated to be at least 20 pounds per year, based on data reported under the Air Toxics "Hot Spots" Program (AB 2588) (ARB, 1997b).

C. Natural Occurrence

o-Anisidine is not known to occur as a natural product (HSDB, 1991).

AMBIENT CONCENTRATIONS

No Air Resources Board data exist for ambient concentrations of o-anisidine.

INDOOR SOURCES AND CONCENTRATIONS

No information about the indoor sources and concentrations of o-anisidine was found in the readily-available literature.

ATMOSPHERIC PERSISTENCE

o-Anisidine is expected to exist in the atmosphere in the gas phase. The dominant atmospheric loss process for o-anisidine is by reaction with the hydroxyl radical. Based on this reaction, the atmospheric half-life and lifetime of o-anisidine is estimated to be about 3 hours and 4 hours, respectively (Atkinson, 1995).

AB 2588 RISK ASSESSMENT INFORMATION

Although o-anisidine is reported as being emitted in California from stationary sources, no health values (cancer or non-cancer) are listed in the California Air Pollution Control Officers Association Air Toxics "Hot Spots" Program Revised 1992 Risk Assessment Guidelines for use in risk assessments (CAPCOA, 1993).

HEALTH EFFECTS

Probable routes of human exposure to o-anisidine are inhalation, ingestion, dermal contact, and eye contact (HSDB, 1991).

Non-Cancer: Inhalation exposure to o-anisidine may cause headaches, vertigo, and effects on the blood (increased sulfhemoglobin and methemoglobin). o-Anisidine is a skin sensitizer (HSDB, 1991; U.S. EPA, 1994a). The United States Environmental Protection Agency (U.S. EPA) has determined that there are inadequate data to establish a Reference Concentration

(RfC) for o-anisidine and has not established an oral Reference Dose (RfD). No information is available on adverse developmental or reproductive effects in humans or animals (U.S. EPA, 1994a).

Cancer: No information is available on the carcinogenic effects of o-anisidine in humans. Oral exposure to o-anisidine hydrochloride resulted in tumors of the urinary bladder in test animals. The U.S. EPA has not classified o-anisidine for carcinogenicity (U.S. EPA, 1994a). The International Agency for Research on Cancer has placed o-anisidine in Group 2B: Possible human carcinogen (IARC, 1987a).

The State of California under Proposition 65 has determined that o-anisidine and o-anisidine hydrochloride are carcinogens (CCR, 1996). The inhalation potency factors that have been used as a basis for regulatory action in California are 4.0×10^{-5} (microgram per cubic meter)$^{-1}$ and 3.1×10^{-5} (microgram per cubic meter)$^{-1}$, respectively (OEHHA, 1994). In other words, the potential excess cancer risk for a person exposed over a lifetime to 1 microgram per cubic meter of o-anisidine is estimated to be no greater than 40 in 1 million, and for o-anisidine hydrochloride, is estimated to be no greater than 31 in 1 million. The oral potency factors that have been used as a basis for regulatory action in California for o-anisidine and o-anisidine hydrochloride are 1.4×10^{-1} (milligram per kilogram per day)$^{-1}$ and 1.1×10^{-1} (milligram per kilogram per day)$^{-1}$, respectively (OEHHA, 1994).